



TRMM Flight Operations Monthly Status Review (MSR)

November 1, 2002



FOT Subsystem Overview

- Operations Status
 - Flight Ops Summary - Lou Kurzmiller
 - Electrical/Thermal - Dave Sepan
 - RCS - Dave Sepan
 - ACS - Dave Sepan
 - Power & Deployables - Justin Knavel
 - FDS - Joe Kowalski
 - C&DH - Nega Berhanu
 - RF / Comm - Nega Berhanu
 - LIS - Nega Berhanu
 - CERES & VIRS – Justin Knavel
 - TMI - Dave Sepan
 - PR – Joe Kowalski
 - Ground System – Justin Knavel
 - Upcoming Activities – Justin Knavel



Flight Operations Summary

- Supported 515 SN events in October
 - 1 Yaw Maneuver; now -X
 - 5 Delta-V Maneuvers; #411 through #415 on 31 Oct
 - » Occurring at 6-8 day intervals
 - » #402 on 02 July

- 1 Anomaly, 18 Event Reports & 8 generic Late Acqs since July
 - AR #97: -Y Solar Array (04 Sep)
 - ER #270 through #287 (01 Jul – 21 Oct)
 - » 2 Late Acqs
 - » 1 TDRS 171 in s/c emergency
 - » 8 Problems w/WSGT
 - » 7 MOC Equipment



Flight Operations Summary

- Notable Events
 - Supported -Y Solar Array recovery activities
 - Supported ERBS EOL activities (Lead Eng)
 - Supporting AutoFDS implementation effort
 - Preparation for Leonids
- Lost 1 Subsystem Engineer in October



Thermal / Electrical Subsystems

- The Thermal subsystem remains nominal
- The Electrical subsystem remains nominal



RCS Subsystem

- RCS performed 5 successful Delta-V maneuvers (#411 - #415)
 - Current fuel remaining is 234 kg by the mass flow method.
 - Current fuel remaining by the PVT method is 212 kg.
 - Current Precision Pressure Transducer level is down to 159.9 psia.
- RCS subsystem is in “blow down” mode and is no longer pressure regulated.
- The current EOL estimate at 402.5 km is June 2005 using 129 kg of fuel as a baseline for controlled re-entry.
- Upcoming Events
 - Review and train with Delta-H procedure, EOL scripts, and the “one-shot” procedure.
 - Review all required steps for a 30+ minute Delta-V maneuver and test with the simulator.



ACS Subsystem

- ACS is performing nominally.
- The Earth Sensor has been powered off to help meet the power budget.
- On 02-284 (October 11th) SA_HALT patch was installed and the minus Y Solar Array motor winding was opened fixing that side of the array at the feathered position.
 - ACS Tables 54, 61, and 66 were loaded to the spacecraft.
 - ACS Table 76 was copied back to RAM from EEPROM.



Power Subsystem

- Open issues
 - On 02-284 (October 11th) the $-Y$ solar array was halted at 0° and the $+Y$ solar array returned to $\pm 50^\circ$ tracking from $\pm 1^\circ$ tracking. The Power system was configured back to CM_2, Gain 1 (12 Amps per battery) from CM_3, Gain 1 (24 Amps per battery). The higher than desired Battery 2 Differential Voltage Average returned to normal after returning to 12 Amps per Battery charging. The Day/Night thresholds also returned to normal: SA Current = 10A and SA Temperature = 32° .



Deployables Subsystem

- -Y SA Sticking Anomaly on 02-247 (September 4th).
 - After the -Y SA stuck for approximately 2 minutes during the slew from -50° to 0°, both SAs were configured back to +/-1° tracking to prevent the -Y SA from sticking in an undesirable position.
 - On 02-284 (October 11th) the SC was configured to allow the +Y SA to track +/-50° with the -Y SA halted at 0°. The commanding was as follows:
 - » Disabled FDC Test 113 (-Y SA not in Commanded Position)
 - » Loaded SA_HALT Patch
 - » Opened -Y SA Motor Winding when the SA was at 0° to prevent the SA from moving.
 - » Loaded new RTS 20 (GSACE Switch). The -Y SA commands were removed to prevent the -Y SA Motor Winding from being closed.
 - » Loaded new ACS System Tables 54, 61, and 66.



Deployables Subsystem

- » Restored ACS System Table 76 from EEPROM to allow the +Y SA to track $\pm 50^\circ$ versus $\pm 1^\circ$.
- ACS TSMs 5, 6, and 7 (-Y SA Commanded and Sensed Position Difference) were disabled on 02-288 (October 15th).
- Disabled FDC Test 112 (+Y SA not in Commanded Position) on 02-303 (October 30th) until a workaround is completed for the GSACE switch RTS 20.
- Future Work
 - » Configure ACE for 15° in Safehold.
 - » GSACE Switch Workaround if +Y SA is not at the Commanded Position.



FDS Subsystem

- The FDS Subsystem remains nominal
- Compiling list of tables with FSW that should be written to EEPROM on both the Spacecraft and ACS processors before Leonids



C&DH Subsystems

- UTCF/FS Status;
 - 3 UTCF Adjustments were performed on 02-275 (Wed., Oct. 2nd), 02-287 (Mon., Oct. 14th) and 02-298 (Fri., Oct. 25th).
 - » Current UTCF value is 31535996.797649 sec
 - » The next Adjustment is expected on 02-309 (Tue., Nov. 5th)
 - No FS Adjustment was performed.
 - » Current FS value is x'7F6'.
 - » The next Adjustment is expected on 02-309 (Tue., Nov. 5th) and will be adjusted to x'802'.
 - No Open issues



RF Subsystem

- 2 Late Acquisitions occurred in October 2002.
 - GLA #127: Occurred on 02-285 (Sat., Oct. 12th) during the 18:20:30z TDE/SA2 event. The S/C was acquired 1:32 minutes late. 1 GCMR was sent; all data was recovered.
 - GLA #128: Occurred on 02-289 (Wed., Oct. 16th) during the 13:02:30z TDS/SA2 event. The S/C was acquired 1 minute late. 1 GCMR was sent; all data was recovered
- 1 RF Event Reports this month.
 - ER #287: late acquisition occurred on 02-294 (Mon., Oct. 21st) during the 04:29:30z 171/SA1 event. 2 GCMRs were sent and the S/C was acquired at 04:31:59 (2:29 minutes late). No impact on data storage activity. WSC did confirm seeing RF at AOS, cause unknown as of today.
- Frequency offsets (monthly average)
 - Transponder #1 = - 49.025 Hz (-43.152Hz since last MSR)
 - Transponder #2 = + 205.989 Hz (134.790Hz since last MSR)
- No open issues



LIS Instrument

- LIS was turned OFF twice because of the SA anomaly:
 - 248/19:56z – 255/13:44z
 - 268/19:29z – 277/12:37z
- 1 Routine MSFC real-time command request was performed on 02-301 (October 28th) to reduce packet sequence errors.
- No open issues



CERES/VIRS Instruments

- **CERES.**
 - Powered OFF.
- **VIRS**, continues to operate nominally.
 - VIRS was powered off from 248/19:56z to 288/14:10z due to the –Y Solar Array Anomaly.
 - Two sets of VIRS Solar Calibrations were performed on 02-296 (Wed., October 23rd).



PR/TMI Instruments

- No open issues with the PR instrument
- PR LNA Analysis performed on 02-293 (Oct 20th)
- No open issues with the TMI instrument



Ground System / Security

- 2 new Auto-FDS PC's were installed
- RTADS is working with minor adjustments on-going.
- New Formats 2002.02 was installed.



Upcoming Activities

- 0-2 Months
 - Leonids (Nov. 19th)
 - Perform remaining FSW revisions due to new Kalman Filter mode of operations and Boost activities
 - » 2000 Epoch Magnetic Field Patch
 - » Table 51 DSS Tolerance Versions
 - » Table 54 Update for Roll/Pitch/Yaw to 15°/8°/8°
 - » TAM B Calibration
 - Place remaining permanent table / patch changes into EEPROM
 - Support finalization of TRMM End of Life and Reentry Plan
 - Aid in Development and Testing of Auto-FDS



Upcoming Activities

- 2-3 Months
 - Participate in End of Life Plan review(s)
 - End Of Life Plan Testing, and Simulations
 - Continue to close open CCRs, MOCRs, and MSR Action Items